

CLAIMS

1. Clutch arrangement in an automatic transmission comprising two axially adjacent multi-disc clutches (B, E) to each of which is assigned a piston-cylinder arrangement for axial clutch actuation, a pressure space for axial actuation, a pressure compensation space for a dynamic clutch actuation pressure compensation and means for lubricant or coolant supply, characterized in that both clutches (B, E) are disposed radially one above another, that the piston-cylinder arrangements for actuation of the two clutch (B, E) are at least to a great extent axially disposed side by side, that the pressure compensation space (25) for the radially outer clutch (B) is located axially next to the pressure space (8) for actuation of a piston (17) of the radially inner clutch (E) and that the lubricant or coolant (30) for the radially outer clutch (B) can be directly tapped from the pressure compensation space (25) for actuation of the outer clutch (B).

2. Clutch arrangement according to claim 1, characterized in that between the pressure space (8) for actuation of the piston (17) of the radially inner clutch (E) and the pressure compensation space (25) for a piston (10) of the radially outer clutch (B), a common disc carrier (9) of the radially inner and of the radially outer clutch (B, E) is situated on which both the inner discs (22) of the outer clutch (B) and also the outer discs (24) of the inner clutch (E) are jointly non-rotatably and axially movably fastened.

3. Clutch arrangement according to claim 2, characterized in that the common disc carrier (9) is connected on a radially inner section with a hub (3) of the disc carrier (9) situated upon a transmission shaft (1) and connected with said transmission shaft (1).

4. Clutch arrangement according to at least one of the preceding claims, characterized in that upon the hub (3) one cylinder (5) is situated in the cup-shaped aperture of which and forming a pressure space (6), a radially inner section of the piston (10) for the outer clutch (B) is axially movably passed.

5. Clutch arrangement according to claim 4, characterized in that the cylinder (5) is formed in two parts, the radially inner wall thereof being formed by

the outer side of the hub (3) and the axially rear wall and radially outer wall by one part mounted on the hub (3) and secured by means of a guard ring (4).

6. Clutch arrangement according to claim 4 or 5, characterized in that the cylinder (5) is sealed tight against pressure medium relative to the hub (3).

7. Clutch arrangement according to claim 6, characterized in that a sealant (67) is vulcanized on the inner side of the axially aligned section of the cylinder (5).

8. Clutch arrangement according to claim 6, characterized in that the cylinder (5) is sealed relative to the hub (3) by a separate sealant.

9. Clutch arrangement according to at least one of the preceding claims, characterized in that the pressure compensation space (25) for the piston (10) is formed between the side axially pointing away from the pressure space (6) of the piston-cylinder arrangement for the radially outer clutch (B) and the radially inner section (54) of the common disc carrier (9).

10. Clutch arrangement according to at least one of the preceding claims, characterized in that in the pressure compensation space (25) for the actuating piston (10) for the outer clutch (B), a recoil element (26) is situated which directly or indirectly (34) supports itself axially by one of its ends on said actuating piston (10) and by its other end on the radially inner section (54) of the common disc carrier (9).

11. Clutch arrangement according to at least one of the preceding claims, characterized in that in the pressure compensation space (25) for the piston (10), one radially aligned baffle plate (34) is fastened on the axially inner section (54) of the common disc carrier (9) in a manner such that between said two parts one coolant or lubricant guide space (59) is formed for the coolant or lubricant flow (30) for the outer clutch (B).

12. Clutch arrangement according to at least one of the preceding claims, characterized in that the baffle plate (34) has on a radially inner section one inlet aperture (51) through which the coolant or lubricant can enter from the pressure compensation space (25) for the outer clutch (B) into the coolant or lubricant guide space (59).

13. Clutch arrangement according to at least one of the preceding claims, characterized in that in the area of a radially outer section of the baffle plate (34) in the common disc carrier (9), one radially outlet aperture (48) is formed through which the coolant or lubricant can exit from the coolant or lubricant guide space (59).

14. Clutch arrangement according to at least one of the preceding claims, characterized in that a flow duct (62) for the coolant or lubricant flow (30) is formed radially above the outlet aperture (48) in the common disc carrier (9) between said disc carrier (9) and a radially outer section of an actuating piston (17) for the radially inner clutch (E).

15. Clutch arrangement according to at least one of the preceding claims, characterized in that in a paraxially aligned section (63) of the common disc carrier (9), radially aligned apertures (piercing 14) are formed through which the coolant or lubricant flow (30) can reach the discs (21, 22) of the outer clutch (B).

16. Clutch arrangement according to at least one of the preceding claims, characterized in that in diameter area beneath the disc set for the clutch (E), both actuating pistons (10, 17) are situated axially directly to the right and the left sides next to the common disc carrier (9).

17. Clutch arrangement according to at least one of the preceding claims, characterized in that on its radially inner section the baffle plate (34) is pressed by the recoil element (26) situated in the pressure compensation space (25) axially against the radially inner section (54) of the common disc carrier (9).

18. Clutch arrangement according to at least one of the preceding claims, characterized in that the baffle plate (34) is clamped on its radially outer section upon the inner side of a horizontally aligned section (47) of the common disc carrier (9).

19. Clutch arrangement according to at least one of the preceding claims, characterized in that the baffle plate (34) carries on the inner side of its radially outer section a sealant (49) which seals the pressure compensation space (25) against the actuating piston (10) for actuating the outer clutch (B).

20. Clutch arrangement according to at least one of the preceding claims, characterized in that the pressure space (8) of the piston-cylinder arrangement for actuation of the radially inner clutch (E) is essentially formed by the wall of the inner section (54) of the common disc carrier (9) that points away from the pressure compensation space (25) for the piston (10) of the outer clutch (B) and one section of the hub (3).

21. Clutch arrangement according to at least one of the preceding claims, characterized in that for the inner clutch (E) one pressure compensation space (31) is formed which is delimited by the hub (3), the baffle plate (19), the same as by the side of the actuating piston (17) pointing away from the common disc carrier (9).

22. Clutch arrangement according to at least one of the preceding claims, characterized in that in the pressure compensation space (31) for the actuating piston (17) of the inner clutch (E), one recoil element (18) is situated which supports itself axially by one end on the baffle plate (19) and by the other end on the actuating piston (17).

23. Clutch arrangement according to at least one of the preceding claims, characterized in that via a sealant (45) the baffle plate (19) seals the pressure compensation space (31) against the left-side "t" leg (42) of the piston (17) pointing away from the common disc carrier (9).

24. Clutch arrangement according to at least one of the preceding claims, characterized in that the piston (17) for actuation of the inner clutch (E) is axially passed by its right-side "t" leg (43) to the paraxial section (47) of the common disc carrier (9).

25. Clutch arrangement according to at least one of the preceding claims, characterized in that the baffle plate (19) and the cylinder (5) are axially secured on the hub (3) by means of snap rings (4, 36).

26. Clutch arrangement according to at least one of the preceding claims, characterized in that the hub (3) is situated upon an axial continuation (52) of the transmission housing (2), is rotatably supported on said continuation (52) and axially supported via an axial bearing (53) against said continuation (52).

27. Clutch arrangement according to at least one of the preceding claims, characterized in that the transmission shaft (1) is designed as input shaft.

28. Clutch arrangement according to at least one of the preceding claims, characterized in that upon the side of the baffle plate (19) remote from the pressure compensation space (31) for the actuating piston (17) of the inner clutch (E), an inner disc carrier (37) of the inner clutch (E) is situated and connected with the transmission shaft (39).

29. Clutch arrangement according to at least one of the preceding claims, characterized in that between the inner disc carrier (37) and the baffle plate (19) of the pressure compensation space (31) for the actuating piston (17) of the inner clutch (E), a flow route (64) is formed for receiving a lubricant and coolant flow (20) for the inner clutch (E).

30. Clutch arrangement according to at least one of the preceding claims, characterized in that the outer disc carrier (38) of the radially outer clutch (B) is situated upon the side remote from the flow route (64) of the inner disc carrier (37) of the inner clutch (E).

31. Clutch arrangement according to at least one of the preceding claims, characterized in that the outer disc carrier (38) of the radially outer clutch (B) is situated upon a transmission shaft (40) which by way of an axial bearing (56) is secured against the transmission shaft (39) on which the inner disc carrier (37) of the inner clutch (E) is fastened.

32. Clutch arrangement according to at least one of the preceding claims, characterized in that the transmission shaft (39) carrying the inner disc carrier (37) of the inner clutch (E) is supported by means of an axial bearing (55) against the transmission shaft (1) carrying the hub (3) and/or against the hub (3).

33. Clutch arrangement according to at least one of the preceding claims, characterized in that the actuating piston (10) of the outer clutch (B) has on its radially outermost end a paraxial section (65) which is designed as rotational speed indicator for a rotational speed sensor (12).

34. Clutch arrangement according to at least one of the preceding claims, characterized in that the radial arrangement of the aperture (51) in the baffle

plate (34) defines the maximum fluid level (7) which the lubricant or coolant reaches in the pressure compensation space (25) for the actuating piston (10) of the outer clutch (B).

35. Clutch arrangement according to at least one of the preceding claims, characterized in that the supply of the pressure compensation space (25) for the piston (10) of the outer clutch (B) and the supply thereof with coolant and lubricant are effected via a hole (57) in the hub (3) which communicates by flow technique with a hole (29) in the continuation (52) of the transmission housing (2).

36. Clutch arrangement according to at least one of the preceding claims, characterized in that the pressure space (6) for the piston-cylinder arrangement (3, 5, 10) for actuation of the outer clutch (B) is supplied with an actuating pressure via a hole (58) in the hub (3) which for its part is connected by flow technique with a hole or peripheral groove (27) in the continuation (52) of the transmission housing (2).

37. Clutch arrangement according to at least one of the preceding claims, characterized in that the pressure space (8) of the actuating cylinder for the radially inner clutch (E) is filled via hole (66) in the hub (3) which is in flow connection with a separate hole or annular groove (28) in the continuation (52) of the transmission housing (2).

38. Clutch arrangement according to at least one of the preceding claims, characterized in that the pressure compensation space (31) can be supplied with coolant or lubricant via a hole (61) in the hub (3).